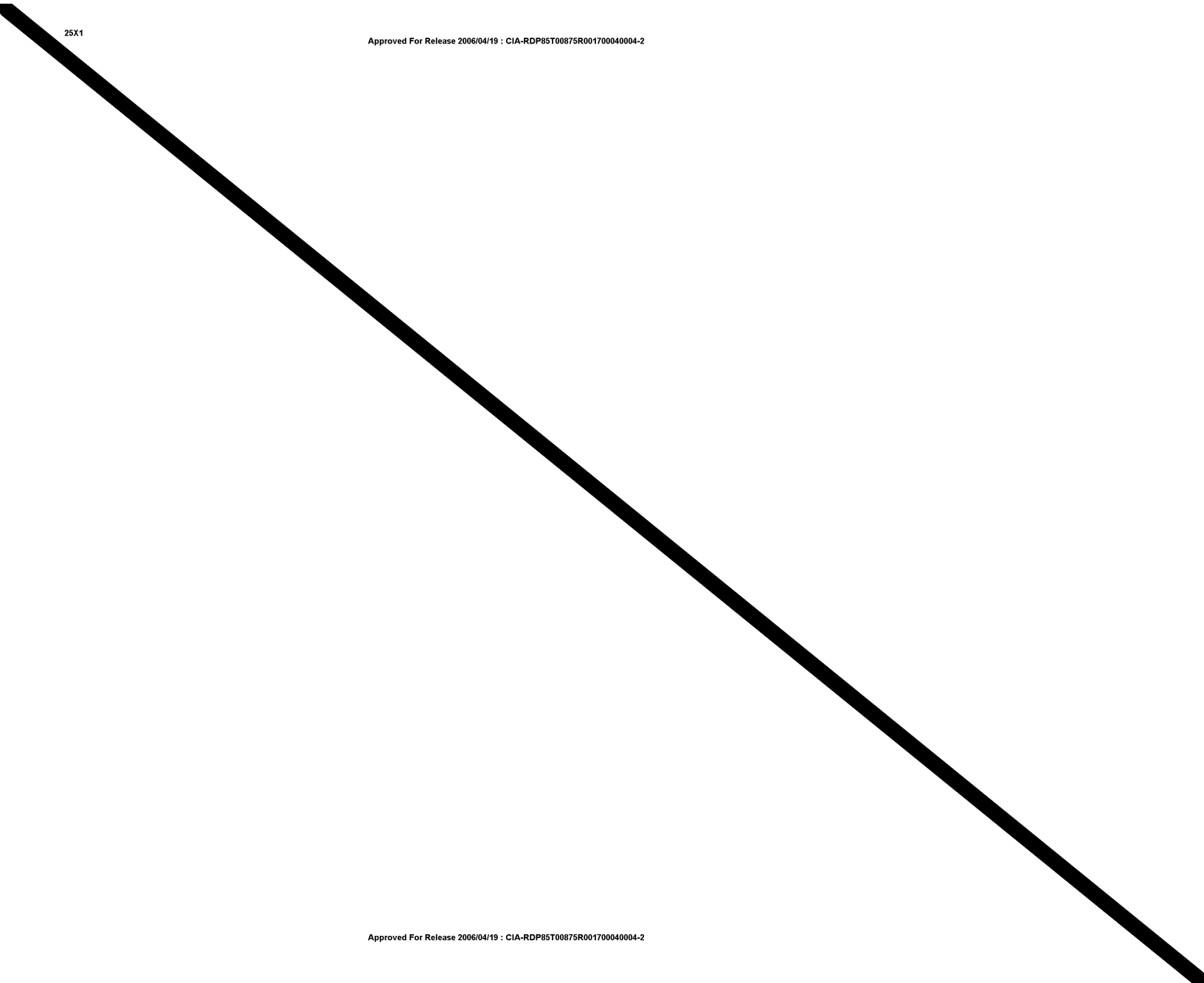

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DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

The Kama Truck Complex: A Progress Report

Secret
ER IM 72-121
August 1972

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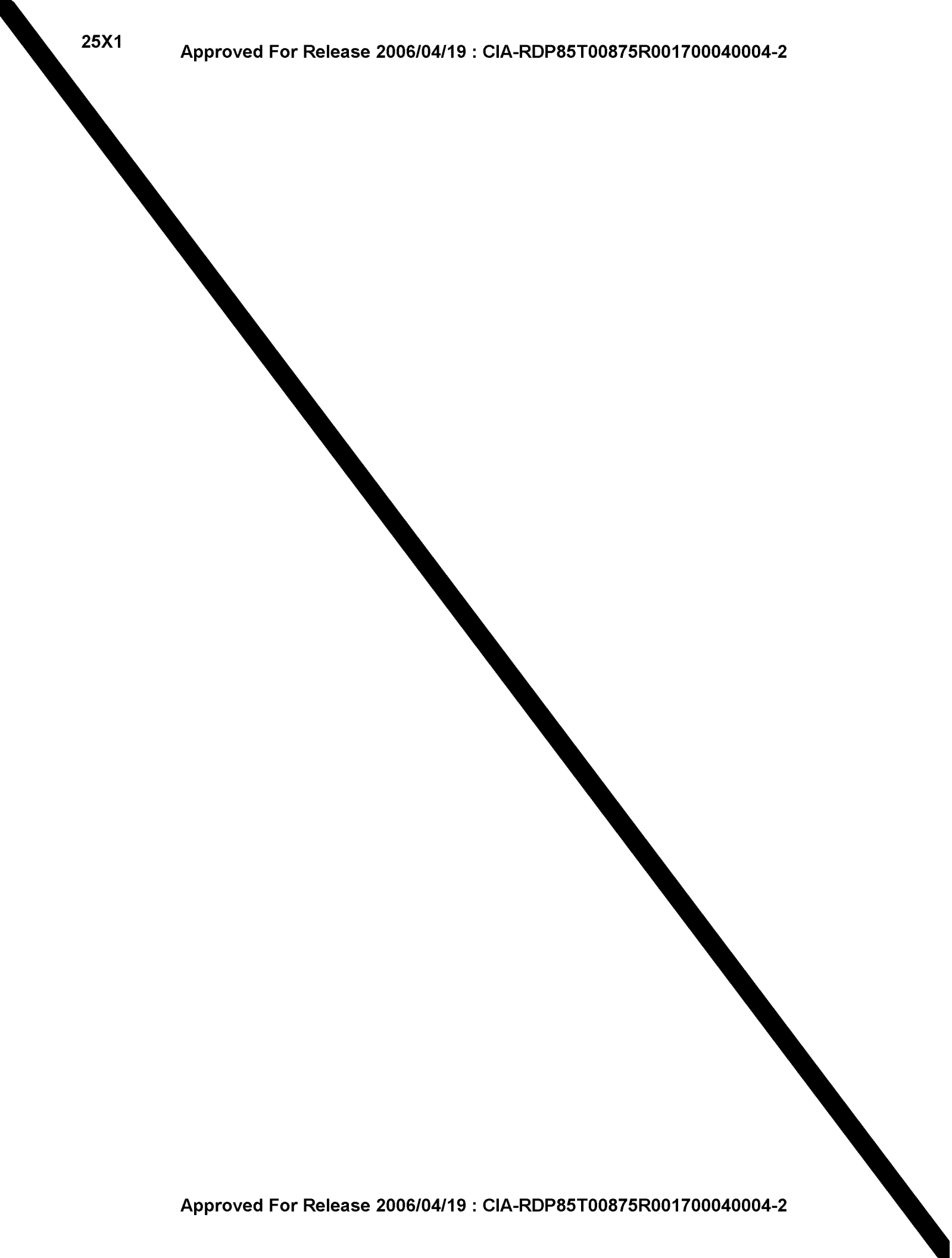

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
August 1972

INTELLIGENCE MEMORANDUM

THE KAMA TRUCK COMPLEX: A PROGRESS REPORT

Summary and Conclusions

1. In 1969 the Soviet Union announced plans to build a manufacturing complex on the Kama River to produce 150,000 medium to heavy trucks annually plus an additional 100,000 engines. This would be roughly equivalent to the combined production of all heavy truck plants in the United States. The facility was scheduled to go into production in 1974. However, it appears to be several months behind schedule.

2. The Kama Complex, located about 600 miles east of Moscow, will consist of six separate manufacturing plants with extensive support facilities. Housing construction got under way in late 1969. Erection of manufacturing facilities was begun in June 1970, but it was mid-1971 before most of the major structures were started. Construction is proceeding briskly, but reportedly less than 30% of it has been completed. Slippage in construction schedules, coupled with delays in equipment procurement, suggests that the complex may not start large-scale production until well into 1975. Moreover, production at full capacity will not be accomplished until some years later.

3. Initially the Soviets envisioned contracting with a large truck building firm in the United States, Western Europe, or Japan to plan and install equipment for the entire project. However, when negotiations with Mack Trucks, Inc. collapsed in September 1971, the Soviets abandoned this approach. They are now enlisting Western technical assistance on a plant-by-plant basis.

4. The design plan for the Kama Complex depends heavily on machinery and technology to be purchased from the West. These purchases could amount to more than $700 million, and the US share might exceed

Note: This memorandum was prepared by the Office of Economic Research.

$200 million. The Soviets have already signed contracts with Western firms totaling $62 million, of which $22 million, or 35%, is with US firms.

Discussion

Location

5. The site of the truck complex is near Naberezhnyye Chelny, a city of 30,000 people about 600 miles east of Moscow on the south bank of the Kama River (see the map). It is close to the power resources of the Volga region and the motor vehicle centers of Tol'yatti, Gor'kiy, and Ul'yanovsk.

Construction Organization

6. The Kama Hydroelectric Power Station Construction Organization, which had been building the Nizhnekamsk hydroelectric station at Naberezhnyye Chelny,(1) was selected to be the general contractor. The entire organization, with its experienced workers, equipment, and sources of material was immediately available for construction of the truck complex – thus saving months in getting work under way. Numerous other construction organizations, including some from Moscow and Leningrad, have been brought in as subcontractors.

Size

7. The manufacturing complex and its support facilities for production of construction materials, workers' housing, and various service industries will cover an area of more than 38 square miles (sq. mi.), roughly 50% larger than Arlington County, Virginia. The six major production plants will occupy 30 million square feet (sq. ft.) of floorspace in an area of approximately 2.6 sq. mi. [redacted] 25X1 The complex will contain some 75 miles of railroads and sidings, 155 miles of roads and streets, and 620 miles of pipeline; moreover, some double-tracking of mainline railroads and improvements to highways serving the area will be required.

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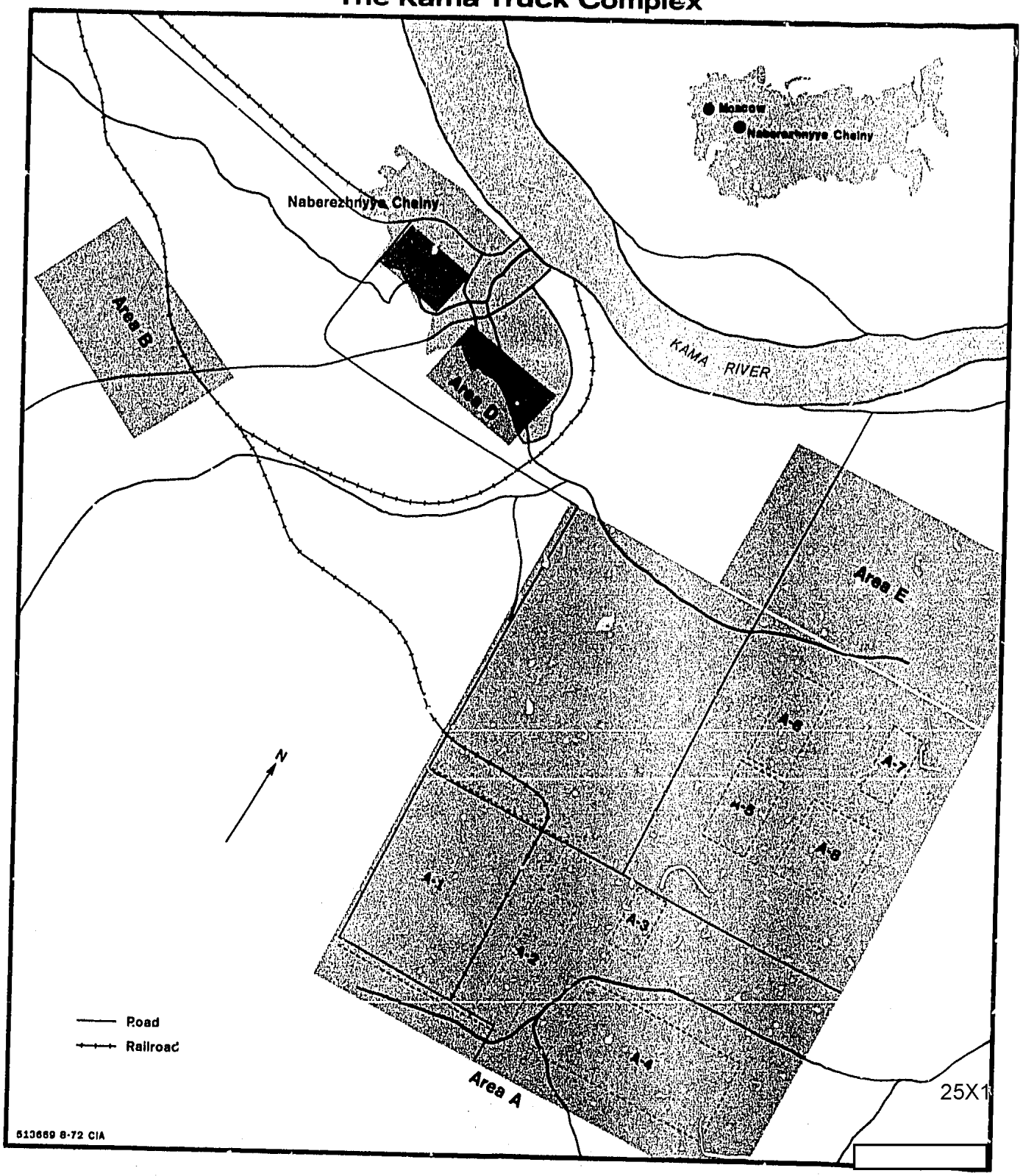
8. Under market conditions prevailing in the developed West, automotive production facilities are usually decentralized, as in the case of Ford truck production. As a result, the Soviet decision to construct all of the manufacturing facilities at one facility rather than having components manufactured at diverse locations and shipped to a central point for assembly, and of building all of the trucks at one location rather than at two or more smaller plants, has been questioned [redacted] 25X1

1. Little or no work has been done on the hydroelectric project since 1969.

The Kama Truck Complex



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The plan does not, however, appear unreasonable in light of conditions that exist in the Soviet Union – notably, the difficulty of assuring uniform quality and timely deliveries of components from suppliers. For this and other reasons unique to the Soviet planned economy, there is no doubt merit in having all operations under one central management in one central location.

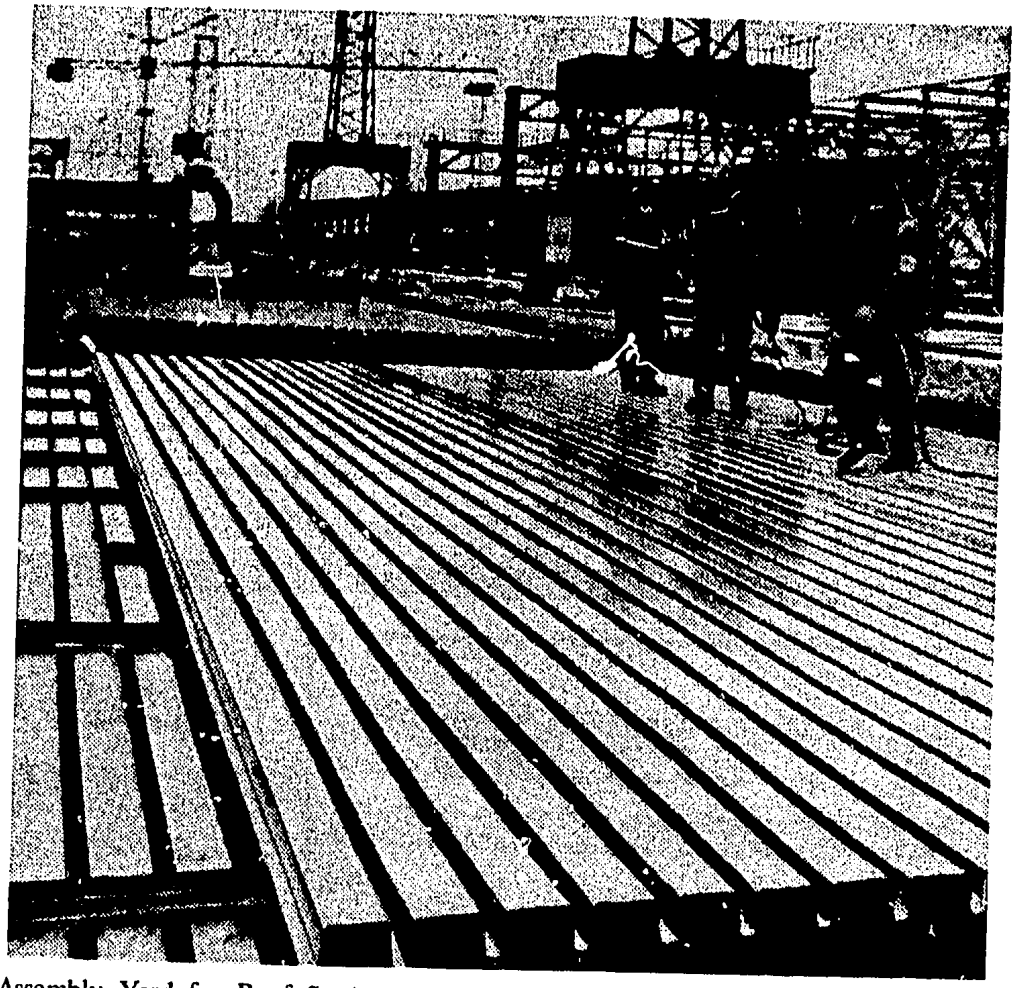
Construction Timetable and Cost

9. The decision to build the Kama Truck Complex at Naberezhnyye Chelny was announced in October 1969, at which time the target date for starting production of trucks was given as 1974. Construction of housing, transportation facilities, and contractor's camp was started almost immediately, and work on the Tooling and Repair Plant and the Grey Iron Foundry got under way in 1970. Although the Soviets continue to give 1974 as the date for start-up of production, it is becoming more and more apparent that this schedule will not be met. Construction of most of the major buildings did not get started until 1971, and some are just now getting under way. Furthermore, delays in contracting for engineering services and for tool and equipment purchases as well as anticipated construction problems will undoubtedly cause additional delays. In view of this and the considerably larger size of the complex, it is probable that slippage in the construction schedule for the Kama project will equal or exceed the approximate one year slippage that occurred in construction of the Tol'yatti automobile plant.

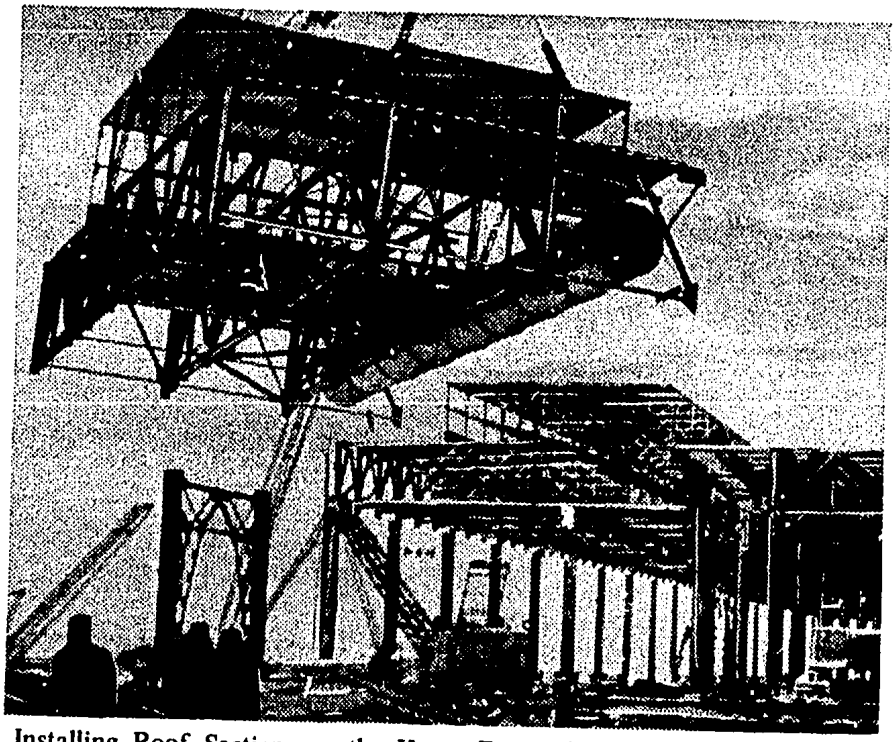
10. The Soviets have estimated that 3 billion rubles will be invested in the Kama Truck Complex. Approximately half of the investment will go into equipment and the balance into construction of buildings and facilities, including housing, transportation, utility systems, a large central heating and electric power station, and installation of equipment. It would cost an estimated $4 billion to $5 billion to duplicate this facility in the United States.

11. During the first ten days of December 1971 the daily volume of construction and installation work was reported to have reached one million rubles – equivalent to the maximum daily rate reached at Tol'yatti during construction of the Volga Automobile Plant. At Kama, however, daily construction rates are scheduled to reach 1.4 million or 1.5 million rubles; construction must reach that tempo if the complex is to start production on schedule. The prefabrication of building components in assembly yards is one of the techniques being used extensively to speed construction as well as to reduce costs. Complete steel truss roof sections measuring 79 feet by 39 feet are being fabricated in assembly yards and moved on rails to the building site where they are lifted into place by means of cranes (see the photographs). A total of about 10.8 million sq. ft. of roof for the Engine Plant, the Pressing and Stamping Plant, and the Assembly Plant are being constructed in this manner.

12. At the end of 1971, about 240 million rubles of construction had been accomplished – about 16% of the total. The construction plan for 1972 calls for 400 million rubles, an additional 27% of the total, which will include 120 million rubles for housing and urban facilities.



Assembly Yard for Roof Sections at the Kama Engine Plant, Fourth Quarter 1971.



Installing Roof Sections on the Kama Engine Plant, First Quarter 1972.

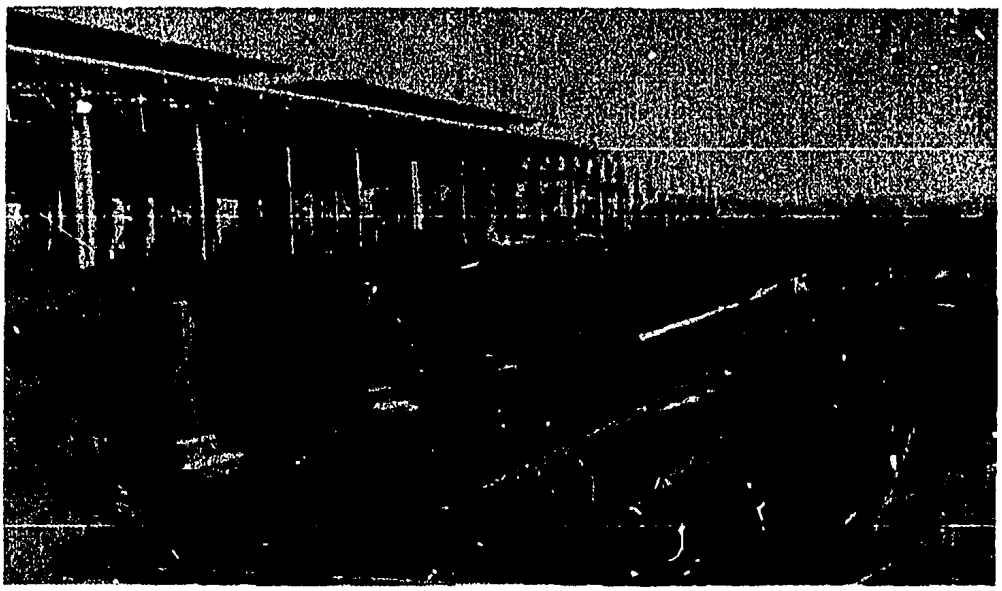
Description of Facilities and Status of Construction

Manufacturing Facilities (Area A)

13. The manufacturing complex will consist of six production facilities or plants: Tooling and Repair; Foundry; Assembly; Pressing and Stamping; Engine; and Forging. (For the size, starting dates, and current status of construction, see Table 2.)

14. The Tooling and Repair Plant is a duplicate of the one built at the Volga Automobile Plant in Tol'yatti. It was the first plant to be started and is scheduled to go into partial operation at the end of this year. Construction appears to be a month or two behind the construction schedule of the similar building at Tol'yatti. Nevertheless, it is proceeding rapidly enough so that part of the plant could go into production by the end of the year if equipment is available.

15. The Foundry is a large complex occupying 0.8 sq. mi. It will consist of four major buildings for production of gray and malleable iron, steel, nonferrous metals, and precision castings, with a total roof area of 3.7 million sq. ft. These are two-story buildings providing a total floor area of over 7 million sq. ft. Ancillary buildings and support facilities add an additional 2 million sq. ft. Construction of the gray and malleable iron casting building started in 1970, but only about 15% of its roof is in place.



Tooling and Repair Plant, First Quarter 1972.

Table 2

USSR: Kama Truck Complex, Production Plants

	Length (Feet)	Width (Feet)	Roof Area (Thousand Square Feet)	Construction Began	Estimated Current Construction Status (Percent Complete)			
					Earth-work	Foundation	Columns	Roof
Tooling and Repair (A-3)								
Main production building	1,535	650	998	Jun 1970	95	95	90	75
Administration/service	1,6 .5	118	191	Jun 1970	100	100	100	75
Foundry (A-4)								
Gray and malleable iron	2,347	792	1,859	Sep 1970	90	45	25	15
Steel	950	556	528	Late 1971	90	25	0	0
Nonferrous	915	714	653	Early 1972	25	0	0	0
Precision casting	950	674	640	--	0	0	0	0
Other (numerous structures)	--	--	2,000	Late 1971	20	0	0	0
Pressing and Stamping (A-5)								
Main production building	2,298	1,161	2,668	May 1971	80	50	20	15
Administration/service	472	157	74	--	0	0	0	0
Other	--	--	123	--	0	0	0	0
Assembly[a] (A-6)								
Main production building	3,780	1,258	4,755	Jun 1971	80	50	25	20
Engine[a] (A-7)								
Main production building	3,150	1,191	3,752	May 1971	80	70	65	35
Forging[a] (A-8)	5 large buildings			Aug 71	Some	Some	Some	0

a. These plants also will have administration/service buildings and probably other ancillary facilities, construction of which has not started and details on which are not available.

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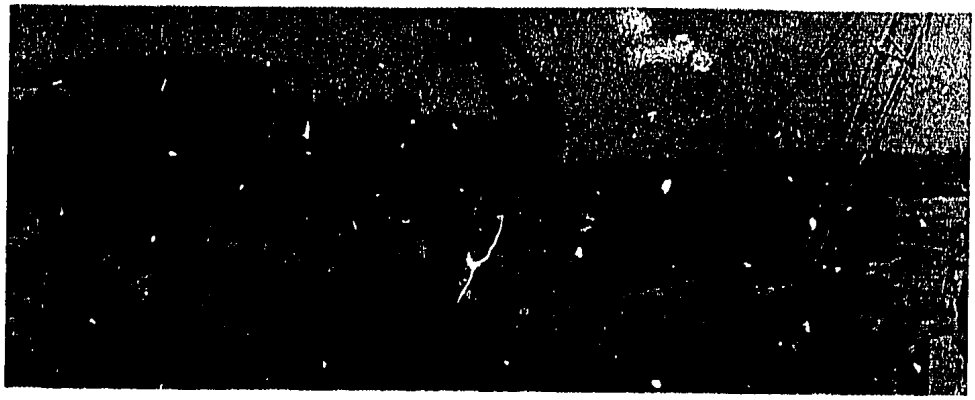
An appreciable amount of foundation work has been accomplished on the steel casting building, and earth moving has started for the non-ferrous casting building.



Gray and Malleable Iron Foundry, Mid-1972.

16. The Assembly Plant, with a roof area of 4.8 million sq. ft., will be the final consumer of the output of each of the other plants with the exception of the Engine Plant, which will produce diesel engines for other Soviet trucks as well as the Kama trucks. The prefabrication yard for roof sections of this building went into operation in late February.

17. The main production building of the Pressing and Stamping Plant will be a large single-story building with a partial basement. It will be connected to the Assembly Plant by two galleries for conveying assembled chassis and cabs. There will also be an administrative/service building, a paint preparation building, and a scrap baling facility. Most of the roof will be prefabricated in the nearby assembly yard, which started production in April. However, two bays which are wider than the prefabricated units – 98 feet instead of 79 feet – are being constructed in place.

18. The Engine Plant will have a roof area of about 3.8 million sq. ft. Foundations are under construction and about 35% of the plant is roofed. One roof prefabrication yard has been in operation since October 1971 and a second is believed to be under construction.

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19. [redacted] the Forging Plant will consist of five large buildings. Although its location is not definitely known, Area A-8 appears to be the logical choice. The status of construction is not known.

Housing (Areas C, D, and E)

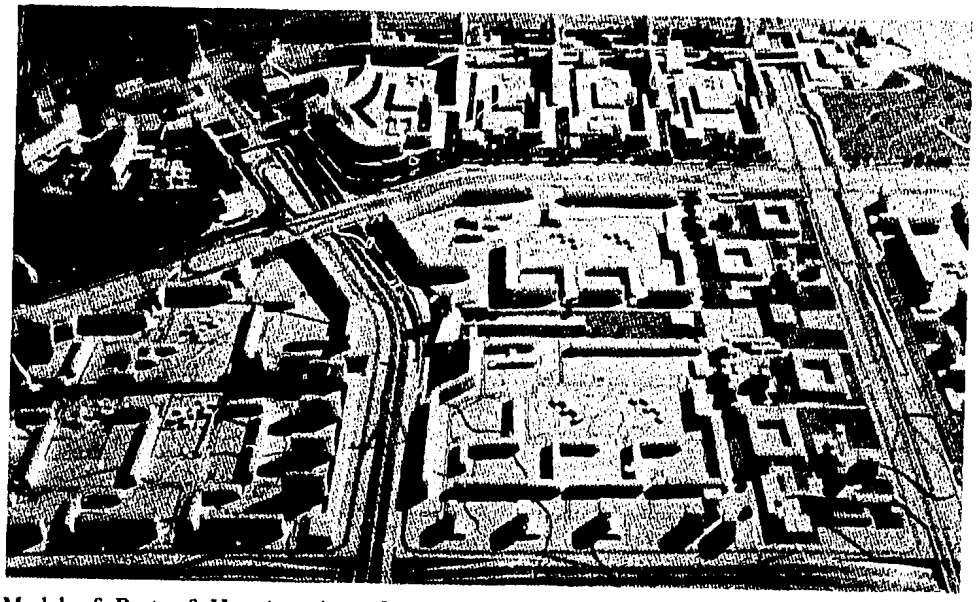
20. Soviet writers claim that experience gained in building the Volga Automobile Plant at Tol'yatti is being utilized at Kama. This appears to be particularly true with respect to housing. At Tol'yatti, housing construction had a low priority, and even now housing, cultural, and service facilities are scarce. At Naberezhnyye Chelny, however, housing construction was started immediately after the decision was made to build the truck plant there, and it has continued at a relatively rapid rate (see the photographs). Of the 21.5 million sq. ft. of housing to be built by the end of 1975, the following amounts were completed by the end of 1971:

Year	Million Square Feet of Useful Space	Apartment Units	Percent of 1975 Total
1969	0.3	600	1.4
1970	1.1	2,200	5.1
1971	2.6	5,200	12.1
Total	**4.0**	**8,000**	**18.6**

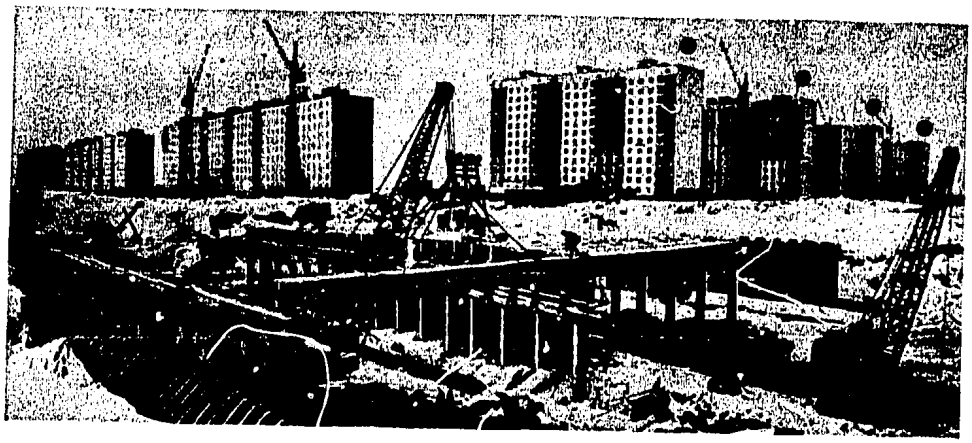
The plan for 1972 calls for 3.2 million sq. ft. (6,400 apartments) to be built. In addition, urban facilities such as schools, kindergartens, stores, movie houses, and other public buildings are being built.

21. Soviet correspondents assert that, although a few barracks-type structures are being built, most of the housing structures are apartment buildings and that workers are not living in tents as they have at most previous large construction projects in the USSR. Nevertheless, there is a serious shortage of housing for the 50,000 construction workers drawn from all parts of the USSR. Apartments are furnished with cots and used like barracks, thousands of trailers have been brought in and located near the construction areas, and many workers are being accommodated in neighboring villages.

22. Although the demand for housing has been increasing at a relatively continuous rate, housing usually is not finished until the end of the year. In each of the years 1970 and 1971, at least one-half of the new housing constructed was put into service in December. Furthermore, in the rush to fulfill annual plans, buildings are frequently accepted with serious deficiencies.



Model of Part of Housing Area for Kama Truck Complex at Naberezhnyye Chelny (Area E).



Construction of a Portion of Housing Area Shown in Model Above, January 1972.

Central Heat and Power Station (Area A-2)

23. Plans for a 520,000 kilowatt central heat and power station were completed in March 1970 and construction was started in May (see Table 3). However, the buildings are still far from finished. The main boiler house has about 15% of its roof in place and the turbine room about 25%. A second boiler house with six boilers, four of which are already in place and operating, is being constructed in the same area.

Table 3

USSR: Kama Truck Complex, Ancillary Facilities

	Construction Began	Estimated Current Construction Status (Percent Complete)				
		Earthwork	Foundations	Columns	Walls	Roof
Heat and Power Station (A-2)						
Turbine room	May 1970	95	60	40	15	25
Boiler house	May 1970	95	70	30	25	15
Auxiliary boiler house	May 1970	100	100	100	80	80
Building Materials Fabricating Area (Area B)						
Housing components plant						
First section	Early 1970	100	100	100	100	100
Storage yard	Early 1970	100	100	100	N.A.	N.A.
Second section	Late 1971	95	50	0	0	0
Precast concrete plant	Early 1970	Several structures still under construction.				
Woodworking facility	Late 1970	100	100	100	100	100
Metalworking facility	Late 1970	100	100	100	100	100
Construction Support Area (A-1) (permanent receiving, storage, and support)						
Engineering	Mid-1970	Area substantially complete.				
Warehouses	Mid-1970					
Vehicle storage and maintenance	Mid-1970					
Concrete mixing plant	Late 1970					

	Total Plan by 1975 (Million Square Feet)	Total Plan (Miles)	Completed at the End of 1971		
			Million Square Feet	Miles	Percent
Housing (Areas C, D, and E)	21.5	--	4.0	--	19
Railroads and siding	--	75	--	52	69
Highways and streets	--	155	--	45	29
Pipelines	--	620	--	72	12

Building Materials Fabrication Area (Area B)

24. One of the first undertakings in connection with the Kama project was the construction of facilities to fabricate components for use in construction of the other structures of the complex. These facilities, which include a precast concrete plant, a facility for fabricating housing components, a wood processing area, and a structural steel fabricating area, occupy a 2 sq. mi. area located about four miles west of the truck manufacturing site.

25. The precast concrete plant covers an area of more than 0.2 sq. mi. and includes a number of buildings, concrete mixers, conveyors, cranes, and railroad sidings. The plant went into production in 1971 even though parts of it are still unfinished.

26. The first section of the plant for fabricating wall, floor, and ceiling panels and structural components for housing units has a capacity of 2,500 apartment units per year. It was scheduled to go into production in 1971 but did not start production until mid-1972. Nevertheless, the second section of the plant, which will double the capacity, is under construction.

27. There are two other completed buildings in this area, one with a roof area of 350,000 sq. ft. and the other with a roof area of 270,000 sq. ft., which are believed to house the wood processing facility and the structural steel fabrication shop, respectively.

Construction Support Area (Area A-1)

28. The Construction Support Area was started in 1970 and reportedly occupies about 2 sq. mi. in the southwest corner of the manufacturing area. It contains buildings to house engineering, shop and fabrication facilities, warehousing, and vehicle storage and maintenance. It has several miles of railroad sidings and service roads, a number of large petroleum storage tanks, a concrete mixing plant,(2) and storage yards equipped with large cranes for handling materials. It is believed that this facility will be used as the permanent receiving, storage, and production support area for the manufacturing complex when construction is finished.

2. This mixing plant with a capacity of 2,500 cubic meters per day was only recently completed. Prior to this, a plant of the same capacity that was originally built for use on the Nizhnekamsk Dam provided concrete for the Kama project.

Machinery and Equipment

Soviet Interest in Foreign Assistance

29. The USSR is planning to rely heavily on the automotive industries in the West[3] to equip the Kama truck complex in order to get the most advanced machinery and technology available. In addition, the Soviets will depend heavily on Western firms to design the plant layouts for many parts of the Kama complex, to specify equipment and suppliers, and to coordinate the procurement and installation of Western-built machinery. Contracts for such technical assistance already have been made with Swindell-Dressler in the United States for the Foundry and Renault of France for the Engine Plant. Other firms in France, the United States, and Japan are bidding for similar technical assistance contracts for other parts of the Kama facility. Overall responsibility for the design and putting into operation of the Kama complex rests with the Ministry of the Automotive Industry.

30. The machine building industry of the USSR is to supply nearly one-third of the production equipment for Kama such as general-purpose machine tools and other standard types of nonspecialized machinery. Soviet machinery plants appear to be unable to supply the large amounts of highly automated machinery needed for the mass production of heavy truck components and the computerized warehousing of parts.

31. The present policy of enlisting Western technical assistance on a plant-by-plant basis is in sharp contrast to the role Soviet planners envisioned initially for Western participation. For more than three years the Soviets sought a large truck building firm in the United States, Western Europe, or Japan to coordinate and manage the planning and installation of equipment for the entire project. Mack Trucks, Inc., the last firm to be contacted, agreed to assume broad responsibilities for management and engineering for the complex. However, in mid-September 1971, Mack canceled its participation, recognizing that the size and complexity of the Kama project and the extent of technical and financial assistance required were too great for any single firm to undertake. With the collapse of the Mack negotiations and the mounting pressures for completion of the project by 1974, the Soviets decided to forgo further attempts to get a major assistance contract with a single Western firm.

32. The Soviets also have abandoned their efforts to purchase from the West a modern truck and engine design. The Likhachev Truck Plant (ZIL) in Moscow has built a prototype truck for Kama (see frontispiece), and the Yaroslav'l Engine Plant has designed a diesel engine

3. The West is defined to include the United States, Western Europe, and Japan.

to power it. The decision by the Soviets to use their own designs, while not satisfactory in all respects, represents the only workable alternative to the direct purchase of design technology in the West. Although the Kama truck is similar in appearance to heavy transport trucks in general use on US highways, it is neither as well designed nor as well built.

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33. Soviet efforts to import truck technology from the United States no longer are hindered by US export restrictions that until recently prevented the sale of equipment for use in truck plants in the USSR. Since the administration's decision in mid-1971 to permit US firms to sell such equipment for the Kama complex, most of the applications for export licenses – which now exceed $1.5 billion – have been approved. Many of the license applications are greatly over-estimated in value, however, and a number are duplicative in that they represent competitive bids.

Competition in the West for Sales to Kama

34. Strong competition exists between firms in Western Europe, Japan, and the United States for sales of machinery, equipment, and technology for the Kama project, and Western Europe stands the best chance to gain the largest share of Soviet orders. Long-term credits are available in West European countries at interest rates of about 6%, and prices are generally lower than in the United States. Other advantages include closer proximity (which implies savings in transport costs), broader trading experience in the USSR, and financial support to suppliers by the European governments. In the United States, firms trading with the USSR have not yet been authorized Export-Import Bank credits or guarantees to help finance and support sales.(4)

35. France holds a particularly favorable position among West European countries because of its close technical ties with the USSR in many areas, its liberal credit policy, and because Renault, a partially government-owned firm, already has an important contract for engineering services to Kama. The French government thus far has extended credits of $216 million to the USSR to accelerate purchases of machinery for Kama in France.

36. West Germany, which sold more than $100 million worth of machinery for the Tol'yatti plant, and Italy, which sold about $300 million

4. When and if Export-Import Bank credits are forthcoming, US suppliers will be on a more competitive basis with Western Europe and Japan because the interest rate of 6% will reduce the overall interest on financing to a rate close to that of other countries. The recent devaluation of the dollar also has to some extent offset the price disadvantage to US firms on machinery sales.

worth, are confident that they will receive substantial orders. Italy has already extended credits of $129 million to finance sales for Kama. Elsewhere in Western Europe, the United Kingdom, Switzerland, Belgium, and Sweden will supply some equipment.

37. Japan could gain a sizable share of the Kama orders. Japanese tool builders recently won the competition for a major share of the equipment for the Pressing and Stamping Plant and are making a strong bid as a major supplier of equipment for the Forging Plant.

38. Although US suppliers are handicapped by higher prices and interest rates, they look forward to capturing a large part of the market because of an edge in technology. The position of US firms as suppliers of equipment to Kama is enhanced by the fact that US firms can probably respond to large orders more rapidly than West European and Japanese firms, and the Soviets consider US automotive production machinery to be the finest in the world. The Soviets have shown particular interest in US designs and production technology for rear axle assemblies. The United States also may be best suited to supply equipment for producing engines, gears, and transmissions.

Soviet Equipment Needs

39. The USSR has not released any data on the planned costs of investment in machinery and equipment for the Kama truck plant. However, it is estimated that the machinery and equipment needed to outfit the six major facilities at Kama would cost close to $1 billion.(5) Machinery for the Engine Plant alone could cost close to $0.5 billion, or nearly one-half of the total. Estimates of the dollar value of the machinery and equipment component of each of the major production facilities are given in Table 4. Equipment for parts of the complex other than that included in the six major facilities – that is, ancillary facilities, most of which the Soviets themselves will supply – may total an additional 500 million rubles.

40. The potential cost of Soviet purchases of machinery and technology in the West is difficult to estimate but could amount to more than $700 million, or about 75% of the total machinery cost.(6) Only a small fraction of this amount has been actually spent; contracts concluded to date with Western firms account for only about 6% of the estimated total cost of the machinery and equipment needed to outfit Kama.

5. Based on US costs. To the extent that the USSR supplies its own equipment or purchases machinery in Eastern Europe or elsewhere in the West, the total cost of outfitting Kama could be substantially less.

6. Based on the experience of the West in supplying equipment and technology for the Tol'yatti plant.

Table 4

USSR: Status of Equipment and Technology for Kama[a]

Plant	Million US $					Signed Contracts as Percent of Estimated Total Value
	Estimated Value of Machinery Required[b]	Signed Contracts in the West		Suppliers		
		Engineering	Machinery and Equipment	Country	Firm	
Tooling and Repair	13	--	1	Switzerland	--	8
Foundry	250	9	--	United States	Swindell-Dressler	4
Engine, Gear, and Transmission	450	9	--	France	Renault	5
			13.5	United States	Gleason	
Forging	40	--	--	--		
Pressing and Stamping	80	--	20	Japan	Ishikawajima-Harima	38
			10	Japan	Aida	
Assembly	150	--	--	--	--	
Total	**983**	**18**	**44.5**			6

a. As of 1 July 1972.

b. Estimates for the Foundry, Forge, and Pressing and Stamping Plants are based on US bids; estimates for the other plants are based on US analogy.

41. The Tooling and Repair Plant will require the least assistance from abroad. This plant, essentially a copy of the counterpart facility designed by FIAT for the Volga Automobile Plant (VAZ) at Tol'yatti, requires, for the most part, only standardized machinery of a type that can be supplied by the USSR or by machinery firms in Eastern Europe. Czechoslovakia, which has contracted to supply $20 million worth of equipment to Kama and which manufactures good-quality general-purpose machine tools, may supply some of the equipment for this plant.

42. The Foundry will be based on US design and will be outfitted mainly, if not entirely, with machinery and equipment purchased in the West. The Soviets desire a very modern, highly automated facility comparable to the new Ford foundry at Flat Rock, Michigan. However, the Soviet foundry will be much larger, with nine pouring lines for castings of gray and malleable iron, compared with five lines at Ford. Unlike the Ford foundry, Kama will have additional lines for casting steel and other alloys.

43. The Engine Plant, the largest, most costly, and most complex of the production facilities at Kama, is being designed by Renault of France. This plant will build 250,000 engines per year, as well as transmissions and differentials. Much of the specialized high volume production equipment such as automatic transfer machine tool lines and conveyor systems probably will be bought in the West.

44. The Pressing and Stamping Plant will consist of three sections: the pressing and stamping operations proper, for the shaping of metal parts for the truck chassis and truck cab; an assembly line; and a paint shop. Most of the equipment will come from the West. Japan is supplying the heavy press lines and the transfer presses. The smaller presses and equipment for the paint shop very likely will be bought in Western Europe and the United States.

45. The Forging Plant will produce components for engines, axles, and steering mechanisms on nine lines. It is likely that Western technical assistance will be sought to lay out this facility, and much of the equipment is certain to be Western-made. One US firm has signed a protocol for designing the forging plant and may receive the contract if it can overcome Japanese competition.

46. The Assembly Plant apparently is still in an unsettled stage of planning. The Soviets have not indicated whether they will seek Western engineering assistance in laying out this facility, but much of the equipment probably will be bought in the West, especially the conveyor systems and automatic process control equipment.

Signed Contracts to Date

47. The Soviets thus far have signed contracts with Western firms valued at $62 million.(7) Of these contracts, $18 million or about 29% represents purchases of engineering and technical services. About 35% of the total value of contracts awarded represent contracts signed with US firms.

48. In the United States, Swindell-Dressler, a division of Pullman Inc. of Pittsburgh and a designer of the Ford foundry at Flat Rock, signed a contract in late 1971 for $9 million for designing the Foundry. 25X1

25X1

49. Swindell-Dressler is uniquely qualified to engineer the Kama Foundry because of the highly successful work the firm recently accomplished for Ford. It designed and built the electric induction furnaces, holding furnaces, and pouring lines which make up the heart of the casting process. Swindell-Dressler also engineered the air cleaning system and performed other engineering services. 25X1

50. The Gleason Company, Rochester, New York, on 15 March 1972 became the first US firm to sign a contract to supply equipment to Kama. Under a $13.5 million contract, Gleason will provide machinery for the manufacture of axle gears, for which they possess virtually a world monopoly.(8) Gleason will build 153 machines, including gear cutting, finishing, and testing equipment. Most will be built in the United States, but 14 units will be manufactured by Gleason's new plant in Belgium. Deliveries are scheduled to be completed by mid-1973.

7. As this memorandum was being prepared for publication, an additional contract for $1.8 million in forging equipment was signed by E.W. Bliss.

8. Minor competitors are Oerlikon of Switzerland and Klingelnberg of West Germany. Oerlikon, however, uses a different tooth form that would not be compatible with the gearing now being produced in the USSR by Gleason-type machinery. Klingelnberg cannot meet Soviet delivery schedules for such large orders.

51. In Western Europe, machine builders in Switzerland have contracted to deliver $1 million worth of machine tools (jig boring machines) to Kama in 1973 for use in the Tooling and Repair Plant. Renault of France, which won the first major contract for Kama to be awarded to a Western firm, is designing the Engine Plant for $9 million. This contract covers engineering and consultant services only. Much of Renault's design work probably is being done by the Saviem division of the firm, which builds heavy trucks and diesel engines.

25X1

53. Japan already has gained a sizable portion of orders for the Kama complex. Under a $30 million contract signed in February 1972, two Japanese firms will supply heavy presses and stamping equipment. Ishikawajima-Harima Heavy Industries will furnish six press lines at a total cost of $20 million, and Aida will supply transfer presses valued at $10 million. Half of the equipment is to be delivered by May 1973, and final shipments are to be concluded by May 1974.

Potential for Future US Sales

54. Future US sales of machinery and technology to Kama are uncertain, because of the intense competition from West European and Japanese firms, but could exceed $200 million. Swindell-Dressler, as designer of the Kama foundry, hopes to sell large amounts of equipment and is opening a sales office in Moscow. At a minimum the firm probably will build the melting and holding furnaces valued at $24 million and related equipment valued at $12 million. Other US firms who may supply foundry equipment include Jervis Webb, conveyor systems; C.E. Cast, moulding lines and core-making machinery; and National Engineering and the Jeffrey Company, sand-moulding machines. Foundry equipment purchases in the United States could exceed $100 million.

55. US firms may also become major suppliers of equipment for the Engine Plant. Renault, the designer of this plant, has stated that it intends to draw heavily on US firms for special technologies in which they excel and which the Soviets particularly want to buy. Interest thus far has centered on technology for machining crankshafts and production lines for such engine components as pistons and fuel injectors. The Soviets also are seeking to buy in the United States a production line for building

transmissions which is an important part of the engine plant.

25X1